Genetics

IINTERFERON-α AND ASTHMA: STUDIES IN THE HUTTERITES

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The Hutterites are a religious sect that originated in the Tyrolean Alps in the 16th century, and are the primary subjects studied for complex trait mapping in Dr. Carole Ober's lab. One such complex trait studied in the lab is asthma, which is a chronic lung disease characterized by shortness of breath, coughing, wheezing, and bronchial hyperresponsiveness. Asthma is influenced both by genetics and environmental factors, such as house-dust mites, molds, pollen, pollution, and smoke. The biological and molecular mechanisms of asthma are not well understood. Even though treatments are available, there is no cure. Therefore, searching for candidate genes that increase asthma susceptibility may enable scientists to understand the molecular mechanisms of asthma and create more effective treatments. A previous study conducted in the Hutterites showed evidence for association to asthma with a marker in the interferon (IFN) gene cluster (Ober et al 2000 AJHG 67:1154-62). The IFN-α gene cluster is located on chromosome 9p21, and encompasses a region of approximately 400 kb. IFN-α is known to be a regulator of the immune system, and is especially important in fighting viral diseases. The main goal of the study was to genotype single nucleotide polymorphisms (SNPs) in members of the IFN-α gene cluster in the Hutterites, using a method called single base extension fluorescence polarization (SBE-FP). Two SNPs, one in the *IFNA6* gene and one in the *IFNA21* gene, were genotyped by this method in the Hutterite population of 760 individuals. The control group consisted of twenty-four non-asthmatics of known genotype. Two statistical tests (Case-Control Test and Transmission-Disequilibrium Test) demonstrated non-significant differences in these IFN-α SNPs among the normal and asthmatic phenotypes. These results suggests that these IFN-α SNPs are not be responsible for the observed association to asthma. In the future, screening for additional variation should be conducted to determine whether variation in the IFN-α gene cluster accounts for the original asthma association observed on choromosome 9.